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An Experiment to Test Infectivity of Cattle which are Reacting to Kenya Attenuated Goat Virus

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In order to ascertain whether or not cattle which are reacting after inoculation with Kenya attenuated goat virus are infective to other cattle, an experiment was conducted on the following lines:—

Thirteen oxen, all about two years old, were chosen from the herd of susceptible cattle which are used for anti-rinderpest vaccine production. Cattle from this herd had been used for vaccine purposes for several months prior to this experiment, during which period over 90 per cent. were found to be susceptible to rinderpest.

As soon as these 13 oxen arrived at the Laboratory they were placed in strict isolation and a separate group of attendants was detailed to look after these animals only, to obviate the risk of any rinderpest infection being carried to them from the rinderpest hospital or elsewhere.

Blood films were prepared from each of the animals on their arrival, and examined for the presence of parasites; all were found to be negative. Throughout the period of the experiment blood films from each animal were examined daily. This was done in order that one could be sure that any rise in temperature shown by these cattle was not due to a latent Protozoan blood infection. It may be noted here that all the cattle showed negative blood films during the whole time of the experiment.

The oxen were isolated in their hospitals on August 7th and their temperatures were taken on that day, all showing normal readings. From that day the temperatures of all the animals were taken and recorded daily until the experiment was concluded.

The oxen were numbered from 1 to 13 and were distributed in their isolation hospitals as follows: eight of them—Nos. 1 and 2, 3 and 4, 5 and 6, and 7 and 8—were placed in pairs in four separate loose boxes, in the one big hospital; the five remaining oxen—Nos. 9, 10, 11, 12, 13—were accommodated all together in one large box situated about 150 yards from the eight other animals.

On August 8th, three of the group of five oxen, *i.e.*, Nos. 9, 10 and 11, were each inoculated with 2 c.c. of Kenya attenuated goat virus. Nos. 12 and 13 were not inoculated but were left in the loose box to see if they would become infected by close natural contact with the inoculated cattle.

On the 12th of the month, two of the inoculated animals, Nos. 9 and 10, began to react, their temperatures rising to 104° and 103·8° F. respectively. No. 11 did not react until the 14th, and as its reaction was delayed, this ox was not used, as a source of infective material, for the experiment.

It was decided that the two oxen, Nos. 9 and 10, should be allowed to react four days before taking material from them for sub-inoculation to the other susceptible cattle.

On August 15th, the two oxen were still running temperatures of 104° and 103·6° F. respectively and showed a slightly increased nasal secretion. There was no ocular discharge. This was the fourth day of their reaction and material was taken from them as follows:—

1. *Urine.*—Samples of urine were obtained from each beast and mixed together. This mixed urine was coarsely filtered through filter paper.

2. *Faeces.*—Approximately 100 grammes of faeces were taken from the rectum of each animal; these two fresh samples were mixed together and well shaken up with about 400 c.c. of normal saline solution. After thorough shaking, this faecal emulsion was coarsely filtered through cotton wool.

3. *Nasal Discharge.*—Nasal washings were prepared from each beast. Normal saline solution was squirted up the nostril and allowed to run out again, being caught in a small basin. This was done several times with each nostril, the same saline, a volume of 200 c.c., being used for all the washings. Finally a piece of cotton wool was used to swab out the nasal chambers and this was then allowed to soak in the saline washings. After ten minutes or so the swab was squeezed dry, the saline from it running in with the rest.

This procedure was carried out with both oxen and the two lots of washings were pooled and well shaken up.

These three lots of material were immediately administered to the susceptible cattle as follows:—

1. Nos. 1 and 2 each received a subcutaneous injection of 25 c.c. of the nasal washings.

2. Nos. 3 and 4 each received a subcutaneous injection of 25 c.c. of the urine.

3. Nos. 5 and 6 each received a subcutaneous injection of 25 c.c. of the filtrate from the faecal emulsion.

4. Nos. 7 and 8 were each given a mixture of the material in the form of a drench. Some of the mixture was given *per nasum* with the animal's head held up so that the material ran down into the pharynx. In this way each of the two oxen received, *per os* and *per nasum*, approximately 100 c.c. of unfiltered faecal emulsion, 100 c.c. of urine and 100 c.c. of nasal washings.

5. Nos. 12 and 13 were not given any of the material, but were simply allowed to remain in close contact with the reacting oxen.

It may be noted here that from the start of the experiment on August 7th until the 14th, all the oxen excepting those which were inoculated with the goat virus had shown normal daily temperature readings, so that it was quite safe to assume that they had not been accidentally infected with rinderpest before entering the hospitals. The isolation precautions, taken after the oxen entered the hospitals, were such as to prevent any outside infection reaching the cattle.

The material from the reacting oxen was given to the other cattle on August 14th, and the daily temperaturing of all the animals continued.

The two reactors, Nos. 9 and 10, were running normal temperatures again on the 17th and 19th respectively. No. 11, which reacted late, starting on the 10th only, had a mild reaction and was back to normal by the 17th.

The other ten cattle gave the following temperature readings after August 14th:—

No. 1 did not show any rise in temperature at all, remaining normal until the readings were discontinued on September 5th.

No. 2 ran a normal temperature until the 22nd, then on the 23rd its temperature rose to 105·4° F., the subsequent readings being 105, 104, 103·8, 101·8 and back to normal at 101° F. on the 30th, after which date it remained normal until readings were discontinued on September 5th.

This constituted a definite reaction. During the reacting period the ox lost its appetite somewhat and appeared slightly depressed, but did not exhibit any marked nasal or ocular discharges.

Oxen Nos. 3 and 4, 5 and 6, 7, 8, 12 and 13 all ran normal daily temperatures until readings were discontinued on August 29th.

It appeared from these readings that the only material which was infective was that which was given to ox No. 2, *i.e.*, the nasal washings; but here a discrepancy arose, as No. 1, which was also inoculated with nasal washings, did not react. There were two possible reasons for this discrepancy: either the reaction shown by ox No. 2 was not due to infection contained in the nasal washings with which it was inoculated, or ox No. 1 did not react because it was immune.

It was also possible that some of the other cattle, Nos. 3, 4, 5, 6, 7, 8, 12 and 13, were immune. Their failure to react might have been attributed to this, instead of to the assumption that the material with which they were inoculated was non-infective, or, in the case of Nos. 12 and 13, to the fact that the reacting animals did not infect by contact.

These points were checked as follows:—

Two more susceptible cattle, numbered 14 and 15, were each inoculated with 10 c.c. of a sample of blood which was taken from ox No. 2 on August 28th. No. 2: reaction was then subsiding.

These two fresh susceptibles, Nos. 14 and 15, both reacted on September 3rd, their daily temperature readings during their reacting period being:—

No. 14—104·6, 104, 104·8, 103·4, 103 and down to 100° F. on September 8th.

No. 15—102·4, 104, 104, 105, 103·2 and down to 100° F. on September 8th.

These sets of readings both constituted good reactions, so that it was evident that the blood of ox No. 2 was infective, and that the reaction shown by ox No. 2 was due to infection contained in the nasal washings with which it was inoculated.

On August 29th, oxen Nos. 3, 4, 5, 6, 7, 8, 12 and 13 were transferred to the rinderpest hospital, and were each inoculated with 10 c.c. of virulent rinderpest blood.

All of these eight cattle reacted vigorously on the third day after receiving the rinderpest virus, their temperatures ranging from 104 to 105° F.

It was apparent, therefore, that none of these eight cattle was immune, and that the six of them which received inoculations or drenches of material from the reacting oxen failed to react because this material was not infective. Similarly the two oxen that were housed with the three reacting cattle failed to react because the latter were not infective by natural contact.

These eight oxen were all slaughtered on the sixth day after they were inoculated with the wild virus and were used for anti-rinderpest vaccine production. At the *post-mortem* examinations of all these cattle it was seen that they all had typical early rinderpest lesions.

Oxen Nos. 9, 10 and 11, the reactors to the goat virus, were also inoculated on the 29th, each with 10 c.c. of virulent rinderpest blood. These three animals did not react at all after the inoculation, showing that their reactions to the goat virus had effectively immunised them against rinderpest.

It still remained to check up on ox No. 1, so on September 5th, oxen Nos. 1 and 2 were transferred to the rinderpest hospital and inoculated each with 10 c.c. of virulent rinderpest blood.

No. 2 did not react at all, showing that it was then immune. This was further proof that its original reaction was due to the virus infection contained in the nasal washings with which it was inoculated, the reaction making it immune to further infection.

No. 1 ran a normal temperature until September 9th and then on the 10th its temperature rose to 103·4°, its subsequent daily temperatures being 104·8, 104·8, 104, 103, 102° F. and down to normal again on the 16th. During the reacting period the ox showed loss of appetite and a very slight nasal discharge, but after the 16th it made a rapid recovery.

From the fact that this ox, No. 2, was late in reacting and did not succumb to the disease, but made a rapid recovery, one can infer that this animal had strong immunity to rinderpest. This ox's immunity was not strong enough for it to resist completely the heavy infection contained in the 10 c.c. of virulent blood, but it was evidently sufficient to resist the milder infection, contained in the nasal washings from the oxen which were reacting to the goat virus.

Summary and Conclusions

The experiment was thus completed and the results obtained may be summarised as follows:—

Cattle which are reacting as a result of inoculation with attenuated goat virus are infective to other susceptible cattle by means of their nasal secretions only; their faeces and urine are non-infective.

The nasal secretion will infect if injected subcutaneously, but it appears that it does not contain a sufficiently high concentration of virus to enable it to infect when given *per os* and *per nasum*, or when susceptible cattle are merely kept in close natural contact with the reactors.

Further, passage of the attenuated virus through oxen does not cause any rapid increase in its virulence. The reactions produced by the virus, after spending two generations in oxen, were no more severe than those produced by the original attenuated virus.

APPENDIX A.

Summary of an Experiment to test the Infectivity of Cattle which are Reacting to Kenya Attenuated Goat Virus

Fifteen susceptible oxen were used for the experiments and the disposition of these cattle and the experimental procedure to which they were subjected is shown in the following tables:—

TABLE I

THREE OXEN WHICH WERE EACH INOCULATED WITH 2 C.C. OF KENYA ATTENUATED G.V.

Animal	Thermal Reaction Revealed by Daily Temperature Readings	Remarks
Ox No. 9	Began to react four days after inoculation, temperature ranging about 104° F.	Used as a source of material, the infectivity of which was to be tested on the fourth day of their reaction.
Ox No. 10	Began to react four days after inoculation, temperature ranging about 103·8° F.	
Ox No. 11	Did not react until the seventh day after inoculation.	As reaction was delayed, this ox not used as source of material.

These three cattle, when inoculated with wild virus three weeks later, all proved to be non-reactors, their reactions to the goat virus having given them immunity. The above cattle were housed in strict isolation from the other cattle used in the test, excepting the two oxen Nos. 12 and 13 mentioned in Table II, which were housed in close contact with Nos. 9, 10 and 11.

TABLE III

EXPERIMENTAL BEHAVIOUR OF EIGHT OXEN WHICH WERE ISOLATED IN PAIRS FROM OTHER CATTLE AND TO WHICH WAS ADMINISTERED MATERIAL OBTAINED FROM THE REACTING OXEN NOS. 9 AND 10.

Animal	Material of which the infectivity was to be tested	Manner of administration to to Test Oxen	Thermal reactions revealed by daily temperaturing of Text Oxen	Remarks
Ox No. 1	Pooled saline washings of nasal chambers of oxen Nos. 9 and 10.	25 c.c. injected subcutaneously	Nil	Saline washings from oxen Nos. 9 and 10, apparently non-infective to No. 1. A subsequent test with wild virus showed that No. 1 was susceptible to rinderpest. This ox reacted late to wild virus, had only a mild attack of rinderpest, and made a rapid recovery. One infers that this ox possessed some immunity to rinderpest, sufficient to resist the infection contained in the nasal washings of Nos. 9 and 10, but not strong enough to resist completely the heavy infection it received when given 10 c.c. of virulent rinderpest blood.
Ox No. 2	Pooled saline washings of nasal chambers of oxen Nos. 9 and 10.	25 c.c. injected subcutaneously	Nil for eight days. Reacted on ninth day. Reaction lasted four days, temperature being 105, 105, 104·8, 103·8° F.	Saline washings from oxen Nos. 9 and 10 were infective to No. 2. That this reaction was due to virus infection was shown as follows: A sample of blood was taken from No. 2 when its temperature was 103·8. Two more oxen, Nos. 14 and 15, were each inoculated with 10 c.c. of this blood. See Table IV. These oxen, Nos. 14 and 15, showed good thermal reaction following the inoculation.
Ox No. 3	Pooled urine from oxen Nos. 9 and 10	25 c.c. injected subcutaneously	Nil	Urine non-infective
Ox No. 4	Pooled urine from oxen Nos. 9 and 10.	25 c.c. injected subcutaneously	Nil	Urine non-infective
Ox. No. 5	Filtered pooled faecal saline emulsion from oxen Nos. 9 and 10. Filtrate used for inoculation.	25 c.c. injected subcutaneously	Nil	Faecal emulsion non-infective
Ox No. 6	Filtered pooled faecal saline emulsion from oxen Nos. 9 and 10. Filtrate used for inoculation.	25 c.c. injected subcutaneously	Nil	Faecal emulsion non-infective
Ox No. 7	A mixture of pooled nasal washings, urine and faeces, from from oxen Nos. 9 and 10.	Given as a drench *per os* and *per nasum*, each ox receiving approximately 100 c.c. faeces, 100 c.c. urine, 100 c.c. nasal washings.	Nil	Mixed material non-infective *per os* and *per nasum*.
Ox No. 8	A mixture of pooled nasal washings, urine and faeces, from oxen Nos. 9 and 10	Given as a drench *per os* and *per nasum*, each ox receiving approximately 100 c.c. faeces, 100 c.c. urine, 100 c.c. nasal washings.	Nil	Mixed material non-infective *per os* and *per nasum*.

All proved to be susceptible when later inoculated with wild virus. Good reactions and typical early rinderpest lesions, when slaughtered on seventh day after inoculated with wild virus.

(For Tables II and IV see foot of page opposite)

Some Clinical Notes—with Special Reference to the Digestive System of the Ox.*

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According to the title of this address, I am to speak on "Some Clinical Notes—with special reference to the Digestive System of the Ox." I am not claiming special knowledge of these disorders but perhaps by bringing them forward for discussion, we may mutually add to each other's knowledge.

The more frequent disturbances of the bovine digestion are, of course, due to functional upsets, but I have no desire to bore you with an account of troubles about which you most likely know more than I do. Rather do I intend to discuss some of the less common conditions, many of which arise from advanced organic changes of some organ such as the stomach or liver. The diagnosis of these diseases cannot be very accurate but with a better understanding, it may be possible to be more accurate than has frequently been the case in the past. Probably a number of the conditions I will describe were diagnosed as "chills" or "chills on the liver," the diagnosis of a liver ailment being mostly an escape route from a difficult situation.

I will first deal with the condition which led to the request for this paper, *viz.*, actinobacillosis of the reticulum in ruminants, the pathological picture of which has been described by Davies and Torrance (1932). Most of my cases have been in Irish bullocks, some two to four years old, but I cannot recall a case in Irish cows. We are usually called because the animal is noticed to be feeding very sparingly but if a change of food is presented it may eat more keenly and then next day will not eat at all. Many of these improve in condition at grass but do not fatten and when brought in again, return to their former condition. The symptoms are mainly negative and examination of the bullock does not show any alarming condition; the rumen is rather empty but the animal's pulse and temperature show little disturbance; in a few cases the temperature may be 102·5° to 103·5°. If left for a time, he barely maintains his weight. Some of these cases will improve after treatment with iodides, but many will not and in these days I think it more economic to send them to the abattoir. The carcase is usually quite good but at the *post-mortem* examination one finds the wall of the reticulum much thickened, in odd cases up to 3 inches; the rumen may also show a patch of thickening, and that may be all, or there may be some inflammatory exudate on the peritoneal surface. In a small percentage you see yellow nodular lesions in a somewhat thickened liver and from these the actinobacillus has been recovered.

Another condition of the rumen of cows that I meet with occasionally (about once a year) is one to which I can give no name as I have never noticed it mentioned in veterinary literature. You find a case which, at the beginning, appears an ordinary disturbance of digestion with anorexia and constipation, but it does not respond to medicine and the abdomen becomes more distended—pendulous rather than filled with gas. Pressing the hand against the left flank you get the impression that the contents are very fluid. In spite of this flaccidity of the abdomen, the bowels do not function. If we rely solely on medicine to relieve the condition, we get in about ten days an opportunity to make a *post-mortem* examination. The only success I have had has been when I was able to drain off a quantity of the liquid contents of the rumen. *Post-mortem* examination shows no lesion throughout the alimentary canal but a big rumen distended with an evil-smelling liquid, no doubt arising from excessive bacterial action on the food in the stomach. The use of thymol, however, in an attempt to check the fermentation, has not been very successful, but I am thinking that if I get another I will try a rumenotomy and by rolling the patient on the left side, drain the contents. At the beginning of this condition one hesitates to proceed to such drastic methods lest there should be an error in diagnosis. As I mentioned earlier, draining the rumen when possible has been the most successful treatment and I wonder if it is in this respect similar to the effect of puncturing the rumen in cases of chronic tympany. There seems to be a limit to the degree of distension which will permit these hollow organs to function and in the case of tympany, soon after the animal is punctured, movement of the bowel wall begins again and the animal may begin to eat and even chew its cud. In chronic tympany we like to do a rumenotomy, leaving a permanent fistula in the rumen and it is surprising how these cases improve after it.

Every now and then we are called to examine a bullock that is completely off its feed and we find in certain cases a very sick animal with a temperature of 105° to 107° F., and a much accelerated pulse. He moves stiffly and, examining for a cause, we find he suffers from a degree of synovitis, especially of his hocks which are tender on pressure. Usually, but not always, these cases suffer from diarrhoea. Many recover after seven to ten days and seem to be relieved a little by palliative treatment with salicylates and fever mixtures. One has to watch carefully, for they do not all recover. If one wishes to slaughter them, there arises the question, what is the possibility of anthrax? At the moment there is less risk, but later when imported feeding-stuffs return, the differential diagnosis will be rather difficult and I do not know how to solve it until the animal is dead. In the type of case described the seat of trouble is in the liver, where one finds a chronic hepatitis, due to *Fusiformis necrophorus*, with small greyish yellow centres of necrotic material, cirrhosis and fatty degeneration. Why do we get this acute flare-up, for the condition must have been in existence some time? Is it a septicaemia due to secondary invaders from the necrotic tissue? I think it was probably an acute phase of this condition which I met with one day in two bullocks grazing on rape. They had temperatures of 106° and 107°, with profuse dark-coloured diarrhoea. I had them slaughtered and the carcases were quite good. *Post-mortem* examination showed congestion of the bowels and acute hepatitis. No anthrax bacilli were found in the blood or spleen.

During meat inspection, especially among aged bullocks, it is really surprising how many cirrhotic livers one finds in good fat bullocks which never in life showed anything abnormal. The most marked cirrhosis of the liver I have seen was due to chronic ragwort poisoning. I have one glen where ragwort is very prevalent and poisoning occurs especially in cattle belonging to shepherds and gamekeepers, who usually have two paddocks which are grazed or used for hay in alternate years. Cattle do not care to eat green ragwort, but when in hay they will do so, with the result that if cows are kept more than two to three years there may be losses from cirrhosis of the liver, which organ is usually enormous. On one occasion I had two cases at the same place within a few weeks and as I happened to have with me, one night, a friend who was an expert in cattle disease, I showed him the cases. He was firmly of the

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TABLE II

TWO OXEN HOUSED IN CLOSE NATURAL CONTACT WITH OXEN NOS. 9, 10 AND 11

Animal	Thermal Reaction Revealed by Daily Temperature Readings	Remarks
Ox No. 12	Nil	No infection took place by natural contact. Cattle proved to be susceptible by subsequent inoculation with wild virus.
Ox No. 13	Nil	

TABLE IV

TWO CATTLE INOCULATED WITH BLOOD TAKEN FROM OX NO. 2 WHILE IT WAS REACTING AS SHOWN IN TABLE III.

Animal	Procedure	Thermal Reaction as shown by Daily Temperature Readings	Remarks
Ox No. 14	Inoculated with 10 c.c. of blood from ox No. 2 when it was reacting.	Good reaction on sixth day, temperature being 104·6, 104, 104·8, 103·4, 103°F.	The reaction showed that the blood from ox No. 2 was infective, so that the reaction of ox No. 2 can be taken as due to the infection contained in the nasal washings with which it was inoculated. This was confirmed later, when ox No. 2 was inoculated with wild virus, and proved them to be immune, the immunity having been conferred on it by the reaction following inoculation with the nasal washings.
Ox No. 15	Inoculated with 10 c.c. of blood from ox No. 2 when it was reacting.	Good reaction on sixth day, temperature being 102·4, 104, 104, 103·5, 103·2°F.	

Note.—During the period of the test, blood slides were prepared daily from each animal, and examined microscopically. All slides were negative, so that it is safe to assume that the thermal reactions recorded were due to the virus and not to any latent protozoan infection.

opinion that they were cases of mineral poisoning. They showed some pain, watery diarrhoea, temperatures of 104° to 105° and the abdomen pendulous as if dropsical. On *post-mortem* examination they were found to have large cirrhotic livers.

Another hepatic condition I meet with, and which clinically provides these same symptoms of elevated temperature, diarrhoea and accelerated breathing, is, I think, due to tuberculosis. I have often said to myself they look like pulmonary cases but there is no evidence by auscultation. These cases like the previous cases of liver necrosis mentioned, may raise in one's mind the possibility of anthrax; it gives one cause for worry but the longest I have known a case of fatal anthrax to continue has been four days, so if in doubt after five days, one would probably be safe to slaughter and it is the most satisfactory procedure in the last-mentioned type of cirrhosis.

We might well ask why these conditions, which have mostly taken a long time to develop, should suddenly break down. The view I have hitherto accepted is that it is when secondary infection of the lesions take place, or when more or less interference with the portal circulation arises, that the more serious symptoms occur.

Discussion

Mr. J. F. Watson, in opening the discussion, said that he frequently came across actinomycotic infections of the alimentary tract in ruminants with symptoms similar to those described by Mr. Nairn, and he had noticed, in addition, that the faeces often had a mucus coating like those in grass disease. He found that Lugol's iodine added to the stock mixture seemed to help recovery. In the cases of liver disease mentioned, he wondered if Mr. Nairn had seen any clinical signs of jaundice. In two cases of gross involvement of liver tissue in bullocks, he had encountered nervous symptoms just before death with muscular twitching, staggering and great excitability. He also had come across cases similar to those described by Mr. Nairn as due to increased bacterial activity in the rumen and wondered whether the condition was analagous to grass disease. He, too, had a large number of cases of necrophorus infection in calves, especially pail-fed animals. Usually the animals were unthrifty with patchy baldness of the head and neck, some oedema about the cheeks, and necrotic ulcers on the tongue and gums. He thought that a number of factors were concerned—lack of colostrum, overcrowding and bad sanitation. He agreed with Mr. Nairn that enlargements of the liver could be tremendous. Some of the biggest he had come across were due to tuberculosis.

Mr. A. Gofton said he could contribute little to the clinical side of the discussion. Actinobacillosis of the reticulum and rumen were common findings in the abattoir and the lower part of the oesophagus was often affected. It might be 1 to 2 inches thick due to infiltration with a watery exudate which ran out on cutting. Secondary involvement of the peritoneum frequently occurred and the condition sometimes extended to the pleurae. The liver also was frequently involved by extension from the peritoneum and fibrosis resulted.

He was interested in Mr. Nairn's suggestion that animals might survive for some time after infection with symptoms of anthrax. He always held that where anthrax was known to be present on a farm, a contact running a very high temperature must be regarded with extreme suspicion. It had been asserted that animals could recover spontaneously and whilst this might be possible so long as the infection remained localised, and the organisms did not invade the bloodstream, he did not think that septicaemic cases would recover. As regards time of survival, it would depend on how long infection remained localised and as to that, they could only guess.

The type of necrophorus infection mentioned was fairly often seen in the abattoir. The carcases usually turned out well, but it depended on the degree of extension of disease in the liver. They seldom got jaundice unless that organ was extensively involved but jaundice was more common in calves than in older animals.

There were various causes of enlarged livers. Tuberculosis had been mentioned, but the largest livers he had seen were due to echinococcus cysts and in those cases the organ might weigh up to 140 or 150 lb.

Professor D. C. Matheson: He could corroborate Mr. Gofton's remarks about cases of actinobacillosis at the abattoir; he also had met with cases in which the disease was widespread in the body.

In connection with multiple disseminated necrosis of the liver of cattle, Professor Matheson drew attention to the older lesions in which the necrotic patch became sequestrated and was gradually removed, though for a time, it could be found as a small, relatively dense, nodule in the centre of the pus; finally encapsulation occurred. Lambs suffering from advanced multiple disseminated necrosis of the liver were sent occasionally to the College.

Professor Matheson warmly commended Mr. Nairn's practice of following up, when circumstances permitted, his clinical observations with a *post-mortem* examination, pointing out that frequently the clinician saw only the symptoms of the case and the pathologist the lesions; he emphasised the desirability of a closer correlation between the two observers, so that the relation between clinical signs and *post-mortem* lesions might be better understood. He had often been impressed by the extent to which an organ, apparently vital to the well-being of the body, was found diseased at the *post-mortem* examination, although during life the animal had shown little or no sign of its disability. It was not possible to say at what stage of tissue destruction a liver became functionally inefficient.

Mr. H. E. Harbour described cases of enlarged livers due to cirrhosis which had been ascribed to ragwort poisoning though that had not been conclusively proved. He was interested to note that Mr. Nairn regarded his cases of necrophorus infection as chronic diseases of the liver which might become acute due to septicaemia. In lambs, however, they came across an acute type in which extensive liver foci developed in a very few days and he wondered whether this was also possible with cattle. The cases with lack of peristalsis, anorexia and a rumen full of fluid presented a picture somewhat similar to grass sickness, and he would like to know whether such animals had any difficulty in swallowing.

Major T. M. Inglis asked on what grounds did Mr. Nairn conclude that ragwort was the cause of death in cows with livers so enlarged as he described?

Major A. Linton Robertson: Mr. Nairn had dealt with two conditions which were the bugbear of a general practitioner in cattle practice, *viz.*, actinobacillosis and bacterial infections in the rumen. When he came across such cases, he liked to get them to the slaughterhouse as soon as possible. A few years ago he got a vaccine prepared for actinobacillosis and the first few cases seemed to respond, but since then it had proved no more effective than iodine treatment. With bacterial infection, if he got them early, he used ammonium carbonate and nux vomica, but in the later stages they were best sent for slaughter. Anthrax was a disease that the practitioner had always to keep in mind. He had once demonstrated the organisms in the blood 12 hours before death. The usual symptoms he got were pyrexia with cold sweating and dark fluid faeces, but he had found that such cases did occasionally recover spontaneously.

Dr. Elliott said he spoke with considerable temerity in the presence of so many clinicians. In the case of so much liquid in the rumen, he would like to know the state of affairs in other compartments of the stomach and also the condition of the pylorus. The findings might be explained as due to a failure in functioning of the pylorus combined with increased pressure stopping peristalsis. Another point he was curious about was the presence of gastric and duodenal ulcers. These were, of course, common in man but had not been recorded very often in animals. He wondered, therefore, whether practitioners came across them very often.

Professor W. M. Mitchell: The discussion that afternoon had been largely about medical problems although they had touched a little on surgery. He would like to have heard, however, a little more detail about the cases Mr. Nairn had described. The fluid material in the rumen, for example, was said to be due to excessive fermentation, but what caused that fermentation? Was it not primarily due to intestinal stasis—thymol certainly would have no effect on that. This was a problem which had a more general significance, for one got the alimentary canal upset first in many medical and surgical conditions, the first sign one noticed being lack of appetite.

He would like to know something about the portal of entry in the actinobacillosis cases. Had Mr. Nairn seen any actual ulceration of the mucous membrane which would allow entrance of the infection? Did the infection begin in the region of the oesophageal groove and extend round the wall of the reticulum?

Such a thickening of the wall of the oesophagus or reticulum was an example of one method by which alimentary obstruction could occur. Another method was by an obstruction in the lumen, but there was a third which was sometimes overlooked, *viz.*, an upset in the dynamics of the alimentary canal from derangements remote from it. More knowledge about this would, he felt sure, help us with problems such as grass disease, for example. Vascular depreciation leading to a diminished blood supply might so lower the vitality of the bowel wall as to lead to paralysis. He wondered, therefore, if cranial mesenteric aneurisms which were so common in horses played any part in predisposing to grass disease. Mr. Nairn had mentioned necrophorus infection and suggested that it gave rise to a bacteraemia or septicaemia. He had found, however, that in horses' feet he frequently got an associated haemolytic streptococcal and necrophorus infection, and he wondered if such a mixed infection occurred also in cattle as, if so the streptococci might be the cause of the septicaemia.

Reply

Mr. Nairn, in his reply, said that he agreed with Mr. Watson that in some cases the faeces were simply mucous-coated boluses like those of grass disease. He himself seldom noticed signs of jaundice in the liver cases he had described, nor had he seen much evidence of nervous symptoms. In some cases there had been a slight staggering but it was not marked or regular. Necrophorus infection in calves was, of course, a well-recognised condition and a subject in itself. It was really a serious plague but he thought that bad hygienic conditions were mainly at the root of it.

He was pleased to hear Mr. Gofton's account of the pathology of the conditions he had mentioned. Mr. Gofton's experience had been wide and if only he could have combined clinical studies with his abattoir experiences, he could have written a most useful textbook. As regards anthrax, he thought a lot of cases did recover, though he agreed that that was unlikely with the septicaemic types. He was interested in the reference to echinococcus infestations; there was not much of this in his district though he had seen it occasionally in sheep.

Mr. Inglis wished to know the grounds on which he based his diagnosis of ragwort poisoning. It was done on the history and *post-mortem* findings and the presence of ragwort in the hay.

Dr. Elliott had asked why the stomach had not emptied itself in those bacterial infections he had mentioned. He thought it might be due to a nervous closure of the outlet from the rumen though he had no definite knowledge as to what might cause such a condition. As regards actinomycotic infections, he thought the reticulum was the seat of the trouble. This organ was readily damaged by foreign bodies and small injuries might allow the organisms to enter. He had never seen ulceration in this condition, however, but it was fairly common in the abomasum in calves.

Professor Mitchell had given them a lengthy discourse on obscure aetiologies, but there was very little need be said in reply. As he had mentioned, in the rumen cases the most helpful treatment was drawing off of fluid, which led to some improvement. He agreed that embolism due to intestinal parasites could block vessels and cause colic in horses, but Gaiger had shown many years ago that this had nothing to do with grass sickness. He himself was inclined to favour the theory of an infective agent being concerned.

WINTER MILK TARGET

Presenting the Royal Agricultural Society's prizes in the Victory Churn Contest, Mr. Tom Williams, Minister of Agriculture, said that milk was still priority No. 1 in our peace-time farming programme. He would like to give dairy farmers and workers in England and Wales an interim target for winter milk, and suggested it should be 100,000,000 gallons in December. Last winter the figure was 87,000,000 gallons, and in 1941 it was only 73,000,000 gallons.

"With 100,000,000 gallons monthly in the depth of winter I believe we shall have gone a long way towards meeting the unrestricted demand of our people," he said. "The deficiency of 13,000,000 gallons will, I am sure, be met partly this coming winter. I should like to see 100,000,000 gallons not later than December, 1947.

"Last winter milk sales totalled 535,000,000 gallons, as against 461,000,000 gallons in the winter of 1941-42. The non-priority consumer of milk is apt to wonder why his ration is not larger and even why rationing is necessary when milk sales now exceed the pre-war level. The reason is, of course, that the demand from priority consumers is still increasing and the total demand is far in excess of that before the war."

* * * * * *

There were 105 million sheep in Australia on March 31st, 1945 (just before the drought broke) compared with 123 million a year earlier. This is reported to be the lowest sheep population since 1929. There was a similar decrease in the 1902 drought, and decreases of about ten millions during the 1914-15 and 1919-20 droughts.—*Farming News.*

THE VETERINARY RECORD

October 27th, 1945

FOWL PARALYSIS (Neurolymphomatosis)

In a recent editorial (August 18th) attention was directed to the dangers which may confront the poultry industry if adequate steps are not taken to prevent the widespread outbreaks of disease which may follow the rapid increase in stocks expected in the post-war period.

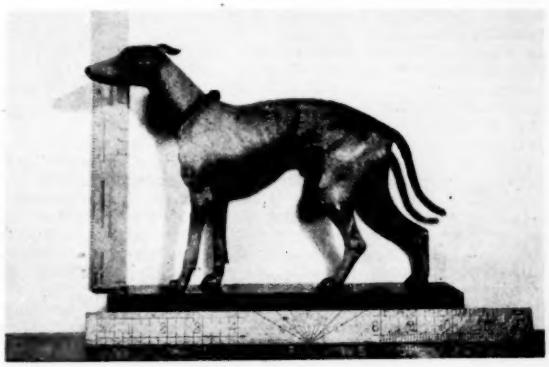
Between 1930 and 1938 fowl paralysis was responsible for extensive losses in every type of flock, and no material abatement in its ravages could be detected at the time of the outbreak of war. Probably as a direct result of the marked reduction in numbers of birds during the past six years, there has been a definite improvement in the position and at present the disease can no longer be regarded as a major affliction of poultry. It would be unwise, however, to assume that the peak has been passed: indeed, it is highly probable that although the disease is less obtrusive, it still exists in all parts of the country, and is liable to break forth with renewed vigour when stocks become augmented.

Although the work of Pappenheimer, Dunn and Cone, Dalling and Warrack, Furth, Blakemore and Glover, Engelbreth-Holm and many others did much to clarify the position, considerable confusion arose regarding its aetiology, and many views were advanced to explain its development. One important theory was that fowl paralysis represented a hereditary neoplastic condition limited to certain strains of fowls, and the fact that it could not be readily transmitted experimentally seemed to support this belief. Another view was that the disease was infectious, and there is now little doubt that this explanation is correct. Blakemore has shown that a virus can be demonstrated in the majority of cases by rapid passage of infective material through groups of susceptible chicks. While further study must be carried out to discover the exact mode of action of the virus, neurolymphomatosis would seem to represent the final stage of an infection which takes place during early life. It has been shown that adults are relatively resistant to infection, and the failure of some investigators to set up a transmissible disease may be attributable to the use of more mature and therefore unsuitable experimental birds. Another important fact which has emerged is that some strains of poultry are much more susceptible than others. The establishment of resistant flocks is, therefore, important, especially as there is also a possibility that the virus can pass through the egg. The incidence of fowl paralysis is highest in pullet flocks and in many respects is more serious than the diseases of chicks.

A maintained and concerted effort in which the administrator, the veterinary profession, the county poultry staff and owners must all play their part, will be required if outbreaks of fowl paralysis and other diseases, as disastrous as those of B.W.D., which struck the industry after the last war, are to be averted. Now is the time for those who are concerned with future development to clarify their views regarding the prevention of diseases. It would obviously be imprudent to allow the distribution of birds from stock believed to be susceptible to fowl paralysis since the virus is still widespread. Research work is needed to elaborate some method for readily determining the relative resistance of various breeds and strains. Insufficient research into poultry diseases is being carried out, and every effort should be made to provide facilities for work on problems connected with fowl paralysis and allied conditions, such as leucaemia, which also exist in our flocks. Recently Asplin found that the sulphonamides have a curative effect on chicks affected with the virus recovered from neurolymphomatosis. It seems possible, therefore, that while the treatment of clinical cases is not at present a practical proposition, further investigation may provide drugs which are of value in the control of fowl paralysis. Poultry owners should be advised of the nature of these diseases and encouraged to adopt such practical measures of control as are available.

A Midget Greyhound

[The following account was given by the late Mr. E. P. Edwards, M.R.C.V.S., of Prestatyn, when exhibiting the stuffed specimen at a meeting of the Society of Veterinary Practitioners held at Chester on March 1st, 1945.—*Editor.*]



Mr. E. P. Edwards, describing this exhibit, said its history was that it had belonged to and when alive was the favourite lap-dog of a former Duchess of St. Albans and died in her possession at the age of three years. "The specimen as now seen was shown in the London Exhibition of 1851. The dog was one of a litter described as 'normal,' but the exact number is not known. Its parents are full-sized greyhounds, and the other puppies are described as having grown to normal stature. Although there is no direct evidence available, it is probable that at birth it was not markedly less than the rest of the litter, for otherwise it would probably have perished in the scramble for milk. What is said is that after weaning, this puppy, presumably the victim of his genetic make-up, like 'Peter Pan' refused to grow up. From nose-tip to the tip of the extended tail it measures 10½ inches, and from the top of the head to the forepaws 7½ inches. Its weight when alive can only be guessed at, but could hardly be more than 2 lb. and may have been considerably less. In conformation and proportion of body the specimen is that of a perfect greyhound in miniature. Strong evidence of the animal having reached maturity is afforded by the presence of a well developed scrotum and prepuce. The true dwarf or 'sport' as distinct from the Cretin, the bulldog calf or the typical circus dwarf, is characterised by the absence of deformities, the normality of its conformation and the correctness of its bodily proportions. All these conditions appear to be fulfilled by the specimen here.

"Two well-known authorities in the profession have very kindly sent me some interesting comments about dwarf dogs, but have not as yet seen this specimen. Such creatures are said to be rare in most breeds, but in Italy a miniature type of greyhound has long been evolved, continues to be bred and is still exhibited and classed among the 'Toy' breeds. No satisfactory history of their origin is known, but it is said that our modern Whippet has resulted from crossing these Italian greyhounds with fox terriers or other breeds. Stonehenge, writing in 1859, describes one of the most famous of these Italian toy greyhounds, named "Gowan's

(*Concluded at foot of col.* 1, *page* 484)

ABSTRACTS

[Immunity Created by Vaccination of Calves with *Brucella abortus* Strain 19. Birch, R. R., Gilman, H. L., and Stone, W. S. (1945.) *Cornell Vet.* **35**. 110-122.]

Because of the steadily increasing use of strain 19 for vaccinating calves against brucellosis it is of paramount importance that our knowledge should be as full as possible both as regards its immediate usefulness in reducing losses and its ultimate status as a sanitary measure. In order to obtain information on these points an experiment was planned which would provide opportunities for observations and systematic examinations over a period of eight years in a large herd exposed to natural infection.

Calves negative to the agglutination test were purchased from herds in the vicinity and vaccinated between the ages of four and eight months. Many were kept as controls. The animals were housed in a breeding barn until they were known to be in calf and then transferred to quarters known as an exposure barn where the animals were kept until they had calved and were again ready to breed. A few remained in the exposure barn all the time. Vaccinated and control cattle were handled alike and were kept loose.

Active brucellosis was maintained in the exposure barn by introducing, from time to time, cows about to abort. In addition, the animals in the experiment contributed to the spread of the disease as 71 pregnancies ended in actual spread of the disease.

All animals were tested monthly by the agglutination test and each time an animal calved or aborted, examinations were made of the milk, uterine discharges and, in cases of abortion, the foetus, to determine spreaders of infection.

The results of these observations are recorded in five tables and an analysis of these reveals the following points.

Vaccinated animals have a decided advantage over controls when the results are studied in terms of live calves, lower abortion rate and a lower incidence of spread of disease at calving time.

Vaccination failed to prevent brucellosis in a surprisingly high percentage of cases, *viz.*, 53 per cent. of vaccinated compared with 67 per cent. controls. But there was definite evidence that the development of the disease was delayed and its effects mitigated. The peak of the disease occurred in the fourth pregnancy in vaccinated animals compared with first and second pregnancies in the controls. There also appeared to be a trend to a lower uterine infection in vaccinated animals, but the difference between the two groups in this respect was not very marked.

Agglutination tests revealed that 22 per cent. of animals showed post-vaccination reactions which persisted more than nine months. These were either a result of vaccination or post-vaccination infection. Three of the animals became spreaders of infection and the strains recovered were not strain 19. These three were also amongst those showing the highest post-vaccination reactions. It is of interest to note that no abortions occurred in this group of persistent reactors, but two vaccinated animals which were not blood reactors at parturition were spreaders of infection and one reacted at the next monthly test.

Reviewing the experiment, the authors point out that "despite failures, which we should learn to expect even when fresh live vaccine is used, the vaccination prevents, delays or mitigates a high percentage of brucellosis. It is much more effective, as our records show, in delaying the development of brucellosis, and in softening its effects than it is in its actual prevention, as approximately half of our vaccinates eventually acquired the infection and became spreaders, without showing as a group, extensive outward manifestations of the disease." The vaccine reduces the abortion rate and delays the time at which the resistance of the animal is likely to break down. Instead of occurring during the heifer's first pregnancy it will probably not do so until the animal's third or fourth pregnancy. This delay assists in establishing clean herds. Furthermore, in a vaccinated herd the presence of more resistant or "semi-immune" animals is not so likely to step up the dosage of infection such as would occur in herds containing susceptible animals.

On the other hand, there are grave dangers attached to the use of vaccines. Probably the most important is that it leaves many unidentified spreaders of brucellosis which may prove a menace if such animals are moved to other herds. Furthermore, it is impossible to distinguish between a reaction caused by vaccination and one brought about by natural infection.

In dairy herds containing vaccinated animals, it is important to remember that both reacting and non-reacting animals may remain spreaders of *Br. abortus* through the milk.

Despite these disadvantages there is no doubt that vaccinated animals represent less danger than unvaccinated ones and the authors consider that more emphasis should be given to the use of vaccine as being in the direction of "eradication" rather than "control," gradual though the former may be. It is not essential to hold that complete eradication is possible in order to accept it as the only logical goal.

G. D.

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[The Role of Nutrition in Equine Periodic Ophthalmia. Jones, T. C., Maurer, F. D., and Roby, T. O. (1945.) *Amer. J. vet. Res.* **6**. 67-80. (29 refs.)]

The interesting suggestion is made that riboflavin deficiency is a factor in the causation of equine periodic ophthalmia. A detailed comparison revealed striking similarities between the histological appearance of the eye lesions of equine periodic ophthalmia and those observed in riboflavin deficiency in experimental animals and in man. The syndrome common to both conditions is initially characterised by photophobia, dimness of vision, epiphora, circumcorneal congestion, corneal vascularisation and corneal opacities. Later, iridocyclitis with resultant posterior synechia, cataract, vitreous opacities or retinal detachment may supervene. The occurrence of such strikingly similar syndromes in the horse and in riboflavin deficient experimental animals, therefore, suggested a common aetiology.

To test this hypothesis, the B complex vitamin content of the commoner equine foodstuffs was determined. This showed that concentrates (oats, maize and some samples of linseed meal), with the exception of wheat bran, are generally low in both riboflavin and nicotinic acid and high in pyridoxine. Thiamin is present in moderately high amounts, but in roughage tends to be lower. Bright-coloured, leafy, well-cured hay, cut before the plants are over-mature, is generally higher in riboflavin than weathered, over-mature, coarse or stemmy hay. These findings indicate that a horse fed entirely on dry foodstuffs obtains most of its riboflavin from roughage, and if this is low in this element, riboflavin deficiency could occur.

The role of ascorbic acid in the ocular structures was also considered. Analyses of equine tissues from affected and normal horses revealed a severe decrease of ascorbic acid in the aqueous and vitreous tumours (where it is normally over 20 times as great as the content of blood plasma) but no significant alteration in other body tissues (adrenals, liver and plasma). The most severe decrease in the eye tissues occurred during the acute stage of the ophthalmia but persisted in a lesser degree during the quiescent stage. This depletion of ocular ascorbic acid in periodic ophthalmia was associated with increased intra-ocular vascular permeability which can be demonstrated by means of a fluorescin test.

The authors propose the following working hypothesis to explain the lesions of equine periodic ophthalmia. Lack of certain dietary essentials, notably riboflavin, may influence the local synthesis of ascorbic acid in the eye tissues, or of the substances (*e.g.*, glutathione) which prevent the auto-oxidation of ascorbic acid. This in turn may produce the lesions of periodic ophthalmia. This theory, however, unquestionably over-simplifies a very complex physiological process, and requires further experimental work to substantiate it or to disprove it. N. J. S.

Billy," and says it was 14½ inches high and 8¾ lb. in weight. The great authority Dalziel, writing of the breed generally, said they should not exceed 7 lb. weight and preferably 4 to 5 lb. It would, therefore, appear that the smallest Italian greyhounds described in veterinary literature are at least twice the size of this specimen. A considerable number of perfect though miniature specimens of human beings have appeared in all ages, the classic modern example being Barnum's 'General Tom Thumb,' famed and exhibited the world over. It is not a paradox to say that the greatness of this specimen, named by its owner 'St. Albans Beauty,' lies in its littleness. Combining with that a perfection of bodily proportion and conformation, it can perhaps claim to be the 'Tom Thumb' of the dog world.

"The specimen has been examined by Professor Robert Newstead, late professor of entomology at Liverpool University, and by Mr. Alfred Newstead, curator of the natural history museum of Chester. Both of these gentlemen, themselves experts in taxidermy, are of opinion that the exhibit is that of a genuine midget greyhound which reached maturity in growth. They describe it as having been prepared by mounting the actual skin of the dog over a plaster cast of the carcase in the usual and best practice of the taxidermist. The present owner is very willing to submit the specimen for expert scientific examination."

Weekly Wisdom

It is not easy to cure folly at short notice.—Menander.

REVIEW

[**Encyclopédie Vétérinaire Périodique.** Revue de Documentation Analytique de Pratique Vétérinaire.]

This encyclopaedia consists of six bi-monthly parts published during 1944 (five parts only have so far been received here) and covers the whole range of veterinary science in the form of abstracts arranged alphabetically. Part 1 goes from Abattage to Azoospermia, Part 5 from Obstétrique to Strongylose. The list of journals from which abstracts have been prepared is a very large one and it is intended to increase it still further as soon as opportunities for obtaining foreign journals occur. In addition to abstracts each number contains several review articles, mainly by well-known French veterinarians (26 articles in the first five published parts), on a variety of subjects: ketosis in cattle, anaesthesia, canine piroplasmosis, biological control of nematode infestation, paroxysmal myoglobinuria of horses, etc. These articles are of considerable interest to practitioners and the whole encyclopaedia appears to be designed primarily for the practising veterinarian.

The six parts published during 1944, together with a special index number, will form a veterinary dictionary for the year and the editors hope that, with the advent of peace (part 3 was published during the liberation of France), it will be possible greatly to extend the scope of the publication so as to include the whole field of veterinary literature throughout the world in subsequent volumes.

The price of the 1944 volume is 350 francs, and of individual numbers 75 francs. The publishers are S.L.E.P., 13, rue Puits-Gaillot, Lyon. The editorial board includes the directors of the three veterinary schools—Alfort, Lyon and Toulouse—and a number of teachers and practitioners.

QUESTIONS IN PARLIAMENT

National Agricultural Advisory Service

Mr. Watkins asked the Minister of Agriculture if he has anything to report upon the progress of the plan for setting up the National Advisory Service.

The Minister of Agriculture (Mr. Tom Williams): I hope to make an announcement very shortly regarding the organisation of the National Agricultural Advisory Service, and salaries and other conditions of employment.

Farm Buildings (Report)

Mr. York asked the Minister of Agriculture whether the Report on Farm Buildings is ready for publication; and what is his intention in regard to the Report.

Mr. Williams: It is expected that printed copies of the Report will be available in a few weeks' time. I would prefer to defer any statement as to my intentions regarding the report until is has been published.

Foot-and-Mouth Disease

Mr. Turton asked the Minister of Agriculture, in view of the warning given by the chief veterinary officer on May 4th, 1945, of the danger of outbreaks of foot-and-mouth disease occurring on the premises of butchers distributing South American meat, what action he proposes to take to prevent the continuance of this danger.

Mr. Williams: The only practicable way in which the danger mentioned in the hon. and gallant Member's Question can be reduced is by observance and enforcement of the existing regulations. Every effort to secure stricter enforcement has been and is being made, and with some apparent success. There have been only two outbreaks of foot-and-mouth disease so far this year on butchers' premises, and three others that may in some way be associated with butchers.

Mr. Raikes asked the Minister of Agriculture how many cattle were destroyed because of foot-and-mouth disease in the last three years, and what proportion were dairy cattle.

Mr. Williams: Since October 1st, 1942, 16,197 cattle have been slaughtered in Great Britain because of outbreaks of foot-and-mouth disease. It is estimated that about 50 per cent. of these were dairy cattle.

Hill Sheep Farming

Mr. Snadden asked the Secretary of State for Scotland when he intends to introduce legislation, based upon the Balfour of Burleigh Report, on the hill sheep industry.

Mr. Fraser: I hope that it may be possible to introduce during the present Session a Bill to give effect to the major recommendations of the Balfour of Burleigh and De La Warr Committees on Hill Sheep Farming.

Overseas Officers (University Courses)

Wing-Commander Hulbert asked the Secretary of State for War if he will arrange for Regular officers who have been serving overseas for a long period to be granted eight or 12 months' leave at home to enable them to attend short university courses or otherwise refresh themselves.

Mr. Lawson: No, Sir; not in present circumstances. Regular officers are in the same position regarding length of overseas tour as those commissioned during the emergency. They have the same opportunities for leave and I see no justification to make the distinction suggested. The military education and refreshment of officers is covered by attendance at courses in this country or overseas. The situation regarding Regular officers who require university courses for military purposes is at present under consideration.

Wild Animal Imports (Shipping Space)

Captain Gammans asked the Minister of War Transport for what reason he sanctioned the use of shipping space from East Africa for the transport of a live elephant and a large consignment of animals for the London Zoo, in view of the great shortage of shipping for repatriation and importation of food.

Mr. Barnes: The animals in question were some of a strictly limited number licensed for importation into the United Kingdom for the re-stocking of Zoos which have been sadly depleted during the war. No special facilities were granted for their shipment and they were carried on deck without encroaching in any way on the space available for passengers or cargo.

Spring Traps

Sir T. Moore asked the Minister of Agriculture when he proposes to withdraw permission from war agricultural executive committees to use steel traps.

Mr. Williams: The authority given to county war agricultural executive committees to permit the setting of spring traps in the open is already limited to cases where this method offers the only effective means of destroying rabbits. The question is therefore one of balancing the disadvantages on humanitarian grounds of the open setting of traps (a matter on which I have considerable personal sympathy) against the urgent need for maximum food production and for the ridding of a pest which takes heavy toll of growing crops. I am seeking the views of Committees on the effect which a withdrawal of permission for open trapping would have on their rabbit-destruction campaign, and I will consider the matter again in the light of these views.

THE PRIMATE ON HUMAN VALUES IN MEDICINE

The Archbishop of Canterbury, giving the inaugural address at the Westminster Hospital Medical School on October 2nd, said that the doctor's profession, in its true meaning and work, had its place side by side with that of the priest. The greatest need of this age and generation was an accepted doctrine of the meaning and purpose of life by which could be controlled the multiplicity of ideas, desires and passions which poured incessantly over human activities. For a long time mankind as a whole had lacked a general unifying conception of life. . . . The medical profession had at least three aspects—scientific, social and personal. Its scientific aspect was a grand, exciting, absorbing pursuit of truth. Medical science at a hundred points touched moral problems and could not be severed from them. But, however much science developed, man was and must be always greater than the science he had developed. He could not create a science which in the end compelled him to commit suicide. It was, perhaps, just worth observing that, because unhappy laymen in these matters were liable at times to get frightened that science was by degrees depriving us of any right to exist. Man remained essentially himself in spite of everything that science might discover about the workings of his machine, physical, psychical, or spiritual. . . . As to the personal side of the medical profession, if the unit of society was the family, the unit of value was the individual. Society could not have a value of its own apart from its members. That principle was by no means established in the world, or even in Europe, yet. Even in our own society here there were imponderable forces which might be calculated to depress the value of the individual as such. He believed that, in the end, what patients looked for far more than medical skill was something stable about the man who ministered to them, in the sense of a wholeness about him—that he had looked at life as a whole and had gained wisdom.

NOTES AND NEWS

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

Oct. 31st.—Meeting of the Lancashire Division, N.V.M.A., at Manchester (Grand Hotel), 2.30 p.m.
Nov. 1st.—Meeting of the Central Veterinary Society, at the Conway Hall, Red Lion Square, W.C.1, 2 p.m.
Nov. 1st.—Meeting of the Derbyshire Division, N.V.M.A., at Sutton Bonington (Midland Agricultural College), 2 p.m.
Nov. 2nd.—Meeting of the Sussex Division, N.V.M.A., at Brighton (Old Ship Hotel), 2.15 p.m.
Nov. 2nd (alteration from 1st).—N.V.M.A. Sub-committee on First-Aid Handbook, 10 a.m.; N.V.M.A. Finance and General Purposes Committee, 1 p.m.
Nov. 5th.—Meeting of the Farmers' Club, Royal Empire Society, W.C.1, 2.30 p.m.
Nov. 6th.—R.C.V.S. Animal Management Examinations.
Nov. 10th.—Meeting of the Biochemical Society, at the London School of Hygiene, Keppel Street, W.C.1, 11.30 a.m.
Nov. 14th.—Benjamin Ward Richardson Lecture on "The Economic and Public Health Advantages of Centralised Slaughtering," by W. Brennan deVine, M.C., F.R.C.V.S., D.V.S.M., Chief Veterinary Officer, Birmingham; Royal Sanitary Institute, 90, Buckingham Palace Road, S.W.1.
Nov. 13th.—Autumn Meeting of the Eastern Counties Division, N.V.M.A., at Thetford (Guildhall), 2 p.m.
Nov. 14th.—Meeting of the Editorial Committee, N.V.M.A., at 36, Gordon Square, W.C.1, 2.30 p.m.
Nov. 17th.—Annual Meeting of the Society of Women Veterinary Surgeons, 69, Great Peter Street, Westminster, 2.15 p.m.
Dec. 4th.—R.C.V.S. Written Examinations.
Dec. 5th.—R.C.V.S. Written Examinations.

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Release from the Armed Forces of Veterinary Surgeons under the Arrangements for Release of Individual Specialists (Class B)

In the note on the above matter published in *The Veterinary Record* dated July 7th, 1945, it was stated that in view of the then military situation the Royal Army Veterinary Corps would not be able to release Veterinary Officers out of turn in Class B, but that it was hoped that a number of such officers, who had served in the Corps since the start of the war, would be released in their age and service groups in the following months.

Now that hostilities have ceased, and having regard to the serious shortage of veterinary man-power for the maintenance of essential civil veterinary services vital to food production, it is understood that the Agricultural Departments are now in a position to consider applications for the release out of turn in Class B under the Individual Specialist scheme of a strictly limited number of Veterinary Officers serving in the Corps. Unless the circumstances are very exceptional such releases will be restricted for the present mainly to Veterinary Officers of long service.

Further information on this matter, including forms of application and an explanatory leaflet, may be obtained from the Ministry of Agriculture and Fisheries, Block 4, Bickenhall Mansions, Bickenhall Street, London, W.1, or from the Department of Agriculture for Scotland, 15, Grosvenor Street, Edinburgh, 12.

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PERSONAL

Appointments.—Dr. James Carmichael, D.SC., M.R.C.V.S., DIP.BACT., has recently joined the technical staff of May & Baker, Ltd., Dagenham, with whom he will be closely identified in the study of veterinary research problems.

For a number of years Dr. Carmichael has been engaged in veterinary research in Uganda, in the course of which he directed important laboratory and field work on a number of subjects, including the evaluation of the diamidine series of drugs, and phenanthridinium compounds in babesiasis and trypanosomiasis.

The British Oil & Cake Mills, Ltd., have appointed Mr. J. K. D. Dow, B.SC., M.R.C.V.S., as Agricultural Adviser to the company's northern branches. He will be resident in Hull. Mr. Dow comes of farming stock and has been closely connected with agriculture, and particularly dairying, all his life. He was educated at Edinburgh University and graduated from the Royal (Dick) Veterinary College. For some years he has been herds manager and veterinary surgeon to a group of farms totalling 7,000 acres. It is hoped that, from shortly after November 1st, Mr. Dow will be available for lectures and advisory work in the northern branches area.

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Births.—DRUMMOND.—At Laundon Nursing Home, Sleaford, on October 14th, 1945, to Lorna, wife of D. J. Drummond, M.R.C.V.S., a son.

WHITE.—On October 18th, 1945, at Pendals, Hampstead Norris, to Grace, wife of E. G. White, PH.D., M.R.C.V.S., a sister (Diana) for Patricia and Angela.

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R.C.V.S. OBITUARY

CALLANAN, Arthur Francis, Gresham Hotel, Dublin, Eire. Graduated Dublin, December 12th, 1922. Died October 16th, 1945.

Mr. Arthur F. Callanan was a prominent personality in Irish coursing and dog racing circles. In 1928 he became veterinary surgeon to Shelbourne Park a year after greyhound racing began. He remained there for five years, when he went to Wembley Stadium. Subsequently he was veterinary surgeon and kennel manager to Park Royal and Wandsworth tracks until his health broke down and he returned home in 1940.

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VETERINARY EDUCATIONAL TRUST SCHOLARSHIPS

The Veterinary Educational Trust announce the award of the following Scholarships, all of which are awarded for the full course of study for the Diploma, M.R.C.V.S.:—

Boots Undergraduate Scholarships of the annual value of £150:—
Cross, M. H., 31, Derwent Road, Lancaster. Lancaster Royal Grammar School. Liverpool Veterinary School.
Shattock, G., 13, Victor Street, Heavitree, Exeter. Hele's School, Exeter. Royal Veterinary College.
Sumner Smith, G., 3, Chaucer Place, Wigan, Lancs. Wigan Grammar School. Liverpool Veterinary School.
Taylor, H. S., Cawston Lane Farm, Dunchurch, Rugby. Lawrence Sheriff School. Liverpool Veterinary School.

Halford Undergraduate Scholarships of the annual value of £100:—
Cox, Gordon, 8, Whitmore Road, Taunton. Taunton School. Royal Veterinary College.
Croft, D. C., Woodfield Lane, Romsley, Birmingham. Halesowen Grammar School. Liverpool Veterinary School.

The above awards bring the total of Undergraduate Scholarships so far awarded by the Trust up to 18. In addition, eight Research Fellowships of an annual value of £450/£800 have been awarded for the investigation of veterinary problems of urgent importance. Further Fellowships will be awarded as the Trust makes progress.

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CENTRAL ADVISORY COMMITTEE ON ARTIFICIAL INSEMINATION

Certain members of the Central Advisory Committee on Artificial Insemination have recently found it necessary to tender their resignations to the Minister of Agriculture. To fill these vacancies the Minister has made the following appointments to the Committees: Mr. R. Donald Scott, Assistant Agricultural Adviser to the Ministry, in place of Mr. Anthony Hurd, M.P.; Mr. F. Grant, O.B.E., an Assistant Secretary of the Ministry, in place of Mr. R. H. Franklin, C.B.E.; Mr. Joseph Edwards, Head of the Dairy Husbandry Department of the Milk Marketing Board, in place of Mr. S. Foster. Mr. F. Vincent and Mr. Dennis Brown of the National Farmers' Union in place of Mr. T. Peacock, C.B.E., J.P., and Mr. R. A. Ward.

The Chairman of the Committee is His Grace the Duke of Norfolk, K.G., P.C.

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BRITISH DAIRY FARMERS' ASSOCIATION

At a meeting of the British Dairy Farmers' Association held on October 10th, the Council was unanimously in agreement with a suggestion that there should now be only one London Dairy Show, this to be under the sole control of the Association. Negotiations to this end are proceeding. No decision could be reached as to the date of the next dairy show.

The following resolution was unanimously passed and a copy forwarded to the Ministry of Agriculture and Fisheries:—

"The Council of the British Dairy Farmers' Association requests the Ministry of Agriculture and Fisheries to increase the numbe

of qualified veterinary surgeons in order that dairy farmers may be able to proceed more rapidly to raise the health standards of their herds."

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THE PHOTO-FINISH

Describing it as "an experiment which may have far-reaching effects," *The Times* makes reference to a private test made recently at the White City Stadium when a photo-finish was made of a series of dog races run over varying distances.

"This method of aiding the judge has been acceptable in America for some time and the wisdom of making use of the photo-finish, when necessary, on our own racecourses has had the serious consideration of the Jockey Club. The whole question of using the camera to determine close finishes was debated in 1939 when the Greyhound Racing Association got in touch with an American expert who continued his experiments in London until the war intervened. Since then the camera has been in operation in America. That now tested is similar to the one used on a great number of tracks in America. It is emphasised that the camera is to be used for the purpose of aiding the judge but not of replacing him. It is stated that it has been found possible to provide the judge with a photograph of a debatable finish in 38 seconds.

The "photo-finish" was officially installed at the White City on October 24th.

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ADDRESSES OF DISEASE-INFECTED PREMISES

FOOT-AND-MOUTH DISEASE:

Northants.—Home Farm, Deeping St. James, Peterborough (Oct. 21st).

Rutland.—Barrow House Farm, Barrow, Oakham (Oct. 19th).

Warwicks.—Corner Farm, Chadshunt, Kineton, Warwick (Oct. 15th).

SWINE FEVER:

Beds.—Beeston Leasehold Farm, Northill (Oct. 19th); Ivel Farm, Lower Caldecot, Biggleswade (Oct. 22nd).

Berks.—Rapley Farm, Winkfield, Windsor (Oct. 19th); Radcot Farm, Appleford, Abingdon (Oct. 20th).

Bucks.—Oakhill Lane Farm, Calverton, Bletchley (Oct. 15th); Bunstye Farm, Gayhurst, Bletchley (Oct. 18th); "The Rectory," Wicken, Bletchley (Oct. 19th).

Cornwall.—Ercildoune, Launceston (Oct. 22nd).

Glos.—Highbeech, The Pludds, Ruardean (Oct. 16th); Station House, Park End, Lydney; Lower Harrow Hill, Drybrook (Oct. 17th).

Lancs.—The Piggeries, New Hall Farm, Liverpool Road, Peel Green, Eccles (Oct. 16th).

Lincs.—Church Farm, Wainfleet, Bank, Wainfleet, Skegness (Oct. 22nd).

Midlothian.—Spylaw Riding School, Colinton, and Gilmerton Gardens, Gilmerton, Edinburgh (Oct. 15th); Easter Drylaw, Davidson's Mains, Edinburgh (Oct. 17th); 17 Holding, Wester Hailes, Slateford, Edinburgh (Oct. 18th).

Northants.—South View, Pondersby, Whittlesey, and Main Street, Farcet, Peterborough (Oct. 17th); 49, New Road, Woodston, Peterborough (Oct. 18th).

Warwicks.—Farmington, Wixford, Bidford-on-Avon (Oct. 15th); The Stables, Canons Ashby House, Canons Ashby, Rugby (Oct. 17th).

Worcs.—Upper Austcliff Farm, Cookley, Kidderminster (Oct. 19th).

Yorks.—Piggeries, Canal Side West, Newport, Brough (Oct. 18th).

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AN INTEGRATED HEALTH SERVICE

"Major A. V. Franklin, R.A.V.C., has briefly described[1] how the Royal Army Veterinary Corps produced fresh and disease-free meat and milk for the armies of the Mediterranean theatres of war," observes the *British Medical Journal* in an editorial published in its issue of September 15th, and continues: "Farms, livestock depots, dairies, abattoirs and inspection services were established on the lines of supply. The work was undertaken at a critical period; it relieved pressure on shipping and home supply, and it grew into a large-scale experiment in military preventive medicine under many and varied environmental conditions. According to Lieut.-Col. H. Nelson, S.A.M.C., who was in charge of the hygiene services of the Union Defence Forces, the supply of fresh food benefited the health of the armies. He has been led by war-time experience to the conclusion that a civilian service, embracing such work as the R.A.V.C. performed, is necessary in order to combat the 'very serious problem' of malnutrition and food-borne infection in his country. In an address before the South African Veterinary Medical Association[2] he proposed the appointment to the civil health departments of 'veterinary officers of health,' who should have charge of services concerned with the health control of food and should help in controlling the sources of infectious disease. In his opinion 'the veterinary officer should become as much a member of the public health team as the medical officer of health.' The theme of Lieut.-Col. Nelson's address was the oneness of the public health service.

"In Great Britain the idea of integrating the medical and veterinary public health services was discussed by members of both professions more than a generation ago. It contributed to the movement which resulted in the formation of the Section of Comparative Medicine of the Royal Society of Medicine in 1923. As the *Proceedings* of the Section over the past 25 years have shown, a harmony of thought, training and purpose unites the two professions, whereas the art and science of examination, diagnosis and treatment of the patient are peculiar to each. Each is an authority in the application of distinctive clinical art and science to its patients. The problem is how the administrative advantages of concentrating the management of a health service in the person of one individual, who is usually a medical officer, can be harmonised with the need for making sectional work sufficiently bright in its prospects to attract other professional officers of high standing. It is an issue which may go far beyond the particular question of the veterinarian's place in public health as the public health services evolve.

"We shall watch with interest how our colleagues in South Africa resolve the difficulties inherent in an integrated public health service. In Great Britain the tendency may be to leave things much as they have been: to accept the principle of collaboration between medical and veterinary officers, between Ministry of Health and Ministry of Agriculture, hoping, when a particular job has to be done, that somehow one or both will rise to the occasion, as the R.A.V.C. did in the Mediterranean theatres of war. In fact, the effect of the Agriculture Act, 1937, has been to diminish the position of veterinary inspectors in the sphere of local government, and to establish a separate veterinary service directly under central management."

[1] *Vet. Rec.* (1944.) **53**. 447.

[2] *J. S. Afr. vet. med. Ass.* (1944.) **15**. 125.

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MINISTRY OF AGRICULTURE NEWS SERVICE

Argentine Press Delegation.—The Minister of Agriculture, Mr. Tom Williams, accompanied by officers of the department, recently met in London the Argentine Press delegation now in this country. The Minister expressed his pleasure at meeting the delegation and explained how and why this country was still pursuing an agricultural policy of war-time intensity. For many years we had been exporters of pedigree livestock as well as large consumers of Argentine produced meat, and he hoped that the visit of the delegation would help towards a return to pre-war trade relations.

Two other subjects touched upon were the export of pedigree bulls and of bloodstock from this country to the Argentine, and foot-and-mouth disease. Of our exports of pedigree bulls in 1938, 70 per cent. went to the Argentine. Even in 1944, with the war at its crisis, some were sent and fetched good prices at the Palermo show, proving that we still had good stock to offer. At the last December Newmarket sales and by private treaty, an Argentine buyer purchased 50 mares and some stallions, £50,000 being spent on the mares alone.

As to foot-and-mouth disease, the delegation was reminded that South America was the only country where the disease was endemic from which we were at present importing meat. During the past 21 months, out of nearly 150 initial outbreaks of the disease no fewer than 120 were definitely associated with swill or directly with imported meat. Districts in this country that for transport and other reasons are supplied solely with home-killed meat, have been virtually free from foot-and-mouth disease. It was suggested to the delegates that during the war years the Argentine had not been able to give such strict attention to the inspection of cattle moving forward to export slaughter yards, but the hope was expressed that closer supervision would be possible in the future.

Visit of French Veterinary Officials.—Mr. Tom Williams, Minister of Agriculture, recently welcomed in London the six veterinary officials, headed by Monsieur Brune, Inspector General of Veterinary Services to the French Ministry of Agriculture, who are now in this country for the purpose of studying our practice in artificial insemination.

The Minister told the visitors that we have ourselves been following developments in recent years in the United States, Denmark and elsewhere. He said that our policy towards this method of breeding had always been one of caution, but from the results that were now being obtained it would appear that it could offer

considerable help in the general up-grading of our stock, and such a result would be of great importance to Europe as a whole. "Whatever information we have is wide open to you," said Mr. Williams.

The progress that has been made, the methods used and the control that is exercised, together with information on the choice of bulls and the number of centres in use, were fully explained by officers of the department who accompanied the Minister.

The French visitors viewed the artificial insemination centres at Cambridge, Ilminster, Totnes and Reading, together with the Institute of Animal Pathology at Cambridge, the National Institute for Research in Dairying at Reading, and the Ministry's Veterinary Laboratory at New Haw, Weybridge.

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Advisers on Science.—The Lord President of the Council has appointed Professor H. Munro Fox, F.R.S., Professor I. M. Heibron, F.R.S., and Mr. C. C. Paterson, F.R.S., to be members of the Advisory Council to the Committee of the Privy Council for Scientific and Industrial Research as from October 1st. Professor A. V. Hill, Sir Felix Pole and Sir Robert Robinson retired from the Council on completion of their terms of office on September 30th.

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal views of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

Letters to the Editor should reach the Office not later than by the first post on Monday morning for insertion in following Saturday's issue.

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VETERINARY EDUCATION

The Loveday Report

Sir,—If anything had been required to justify the attitude taken up by the Council, R.C.V.S., and to frustrate the activities of our "Trojan Horsemen," it appears to be now at hand. It will be remembered, by most of us, that in his letter dated January 13th, 1943, to Dr. Loveday, Mr. R. S. Hudson, the then Minister of Agriculture, said:—

> "The Government has announced its intention of maintaining after the war a healthy and well-balanced agriculture as an essential and permanent feature of national policy. . . . We are satisfied, therefore, that in the changed circumstances not only is a better training for the veterinarians of the future of vital importance to agriculture, but also numbers substantially greater than exist at present . . . will be required for the efficiency and well-being of the livestock branch of the industry."

This was distinctly, and plainly, a piece of advice on which Dr. Loveday's Committee could base their findings. That they did act on Mr. Hudson's advice is proved beyond all doubt in the following extract from the Committee's report:—

> "In our deliberations and discussions we have continually had in mind the Government's intention. . . . We wish to emphasise that our present recommendations are based on the assumption that agriculture will in future be maintained in a healthy and prosperous condition. . . . It would in our view be futile to provide improved educational facilities unless there is a reasonable assurance that attractive employment will be available to those who qualify."

That emphasises, beyond all doubt, that the Committee's recommendations, especially as regards the numbers of veterinary surgeons required in the future, depended entirely on this reasonable assurance given by Mr. Hudson that the numbers required would be substantially greater.

For the correct estimation of the value to be placed upon this "reasonable assurance" one cannot do better than consider the following extract from the *Sunday Times*, of to-day's date, taken from an article "Future of Agriculture" by the same Mr. Hudson:

> "It is impossible in my view to lay down to-day in any detail what the size and content of our future agriculture is to be. Its level of prosperity and its pattern will be conditioned by many factors outside its immediate control."

The present policy of the R.C.V.S. of carrying on as usual, and waiting on events, could surely receive no firmer support than this admission.

Yours faithfully,

23, Queen's Gate Gardens, London, S.W.7. THOMAS LISHMAN.

October 14th, 1945.

Sir,—Mr. Ll. E. W. Bevan's letter in to-day's issue of *The Veterinary Record* is timely, and clearly reflects the strong opinion of a great proportion of the profession.

It is admitted we require at the earliest possible date a large number of enthusiastic and well-trained young men of the *right type*. The proposal that they can be turned out by universities, as from a sausage machine, is just nonsense. There is only one fit and competent body to arrange this great recruitment, and that is the properly constituted Royal College of Veterinary Surgeons. If, as Mr. Bevan suggests might happen, an attempt is made to rush through an Act of Parliament to deprive the College of its ancient rights and privileges, then it behoves everyone who is of the opposite way of thinking to do everything possible to fight it. The student's practical training depends very largely on the country practitioner. It would, therefore, surely be very unwise to alienate the sympathy of practitioners.

The profession has very little to be ashamed of in the past and much to be proud of, considering the scandalous way it has been treated. Let the Government recognise that and leave the reconstitution in the hands of the only body capable of doing it, and encourage it to do so in all ways. Threats, open or veiled, will do more harm than good, and the sooner that is realised by the people, both within and without the profession, who are instigating the "new order," the better it will be for all.

Yours faithfully,

63, Derngate, Northampton. J. J. DUNLOP.

October 20th, 1945.

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PET SHOP SALES

Sir,—The R.S.P.C.A. has found what we believe to be the solution of the problem, but it involves further legislation.

Animal protection can only be dealt with by private Members' Bills and the Government has taken all Parliament's time for the present session, which means a delay of at least a year. Meanwhile we can only do a little concerning this undesirable trade.

I am sure that in due course, when we consult the veterinary profession, we shall have their full co-operation.

Yours faithfully,

S. G. POLHILL,
Acting Chief Secretary.

Royal Society for the Prevention of Cruelty to Animals,
105, Jermyn Street, London, S.W.1
October 13th, 1945.

DISEASES OF ANIMALS ACTS, 1894 TO 1937, AND AGRICULTURE ACT, 1937 (PART IV).

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period	Anthrax	Foot-and-mouth	Parasitic Mange*	Sheep Scab	Swine Fever
Sept. 16th to 30th, 1945 ...	8	1	—	45	51
Corresponding period in—					
1944 ...	5	11	—	3	129
1943 ...	11	—	—	2	19
1942 ...	16	57	—	1	21
Total Jan. 1st to Sept. 30th, 1945	88	110	6	96	753
Corresponding period in—					
1944 ...	138	83	7	80	994
1943 ...	218	15	6	115	401
1942 ..	252	502	26	131	350

NOTE.—The figures for the current year are approximate only.
* Excluding outbreaks in Army Horses.

Tuberculosis (Attested Herds) Schemes

The number of Attested Herds, *i.e.*, herds officially certified as free from Tuberculosis as at September 30th, 1945, was as follows:—

England	Wales	Scotland	Total (Great Britain)
5,107	9,040	5,286	19,433